Response to Comments Document

Total Maximum Daily Load (TMDL) Development for Hawksbill Creek: *E. coli* (Bacteria) Impairment

Introduction

A final public meeting was held for the Hawksbill Creek bacteria TMDL on March 18, 2004. The draft TMDL report (Total Maximum Daily Load (TMDL) Development for Hawksbill Creek: E. coli (Bacteria) Impairment) was presented at the meeting and made available on the DEQ website. A public comment period on the draft report was held from March 18, 2004 until April 17, 2004. During the public comment period, one set of comments was received from Charles Lunsford of the Virginia Department of Conservation and Recreation. These comments are presented below, followed by DEQ's response to each comment.

Comments Submitted by Charles Lunsford

Comment 1

The acronyms "NCDC" and "MRLC" should not be used in the Executive Summary.

Response

The Executive Summary was revised to omit these acronyms.

Comment 2

Executive Summary, Existing Condition. The model run of existing conditions is not just based on the DEQ fecal coliform bacteria/*E. coli* translator data, but would also include the actual *E. coli* data collected.

Response

The referenced sentence simply describes that existing conditions were modeled based on fecal coliform loads that were translated to E. coli loads based on DEQ's fecal coliform bacteria/E. coli translator. As the commenter suggests, the model was calibrated using available fecal coliform and E. coli monitoring data. Model calibration is further explained in Section 4.6 of the report.

Comment 3

How is the citizen monitoring data actually used in the development of the TMDL? The data is presented but there is not an explanation as to how it was used.

Response

Additional language was added to the water quality calibration section to describe that citizen monitoring data, in addition to DEQ monitoring data, were compared to model results during the water quality calibration process.

Comment 4

Last sentence on page 2-6 – all of the data in Table 2.3 was not collected at VADEQ monitoring stations.

Response

This sentence was corrected to include a description of monitoring data from the Page County Water Quality Advisory Committee as well as DEQ.

Comment 5

BST data. Based on the BST results which indicates the prevalence of pets as a bacteria source why are pets not included in the allocation scenarios?

Response

Pet bacterial loads were included as a contributor to the "Built-Up" or urban land loads. Additional language was added in Section 4.3.4 to further explain the incorporation of pet loads.

Comment 6

Section 3.1. What period of time does "past" refer to in reference to the combined sewer overflows? When was this source removed in the watershed?

Response

During May and June of 1996, a blockage in a sewer line in the Town of Luray caused an extended period of intermittent to continuous overflows into Hawksbill Creek. The situation was temporarily corrected in June 1996 by the construction of bypass lines to bypass the blockage. Within the following months, a permanent solution was devised and a pump station was constructed at the site. For this reason, sewer overflows were included as a potential source on the TMDL factsheet.

Comment 7

DEQ needs to use some consistency in the stream access (hours) used in the bacteria TMDLs. For example the draft Muddy Run bacteria TMDL in Culpeper County used a monthly range of 0.50 – 3.50 hours/day and the Hawksbill Creek TMDL is based on 0.25 to 0.50 hours/day. Even with local farmer input there should not be this big of a difference in how the nonpoint source loadings are being modeled from one watershed to the next.

Response

Stream access estimates used in the Hawksbill Creek TMDL were consistent with recent research on the topic (DCR funded study by Virginia Tech and MapTech, 2002. Modeling Cattle Stream Access) and validated by local farmer input. Virginia Tech and MapTech conducted studies on three farms where cattle movements and stream access were videotaped around the clock. Monthly averages (across all three farms) for cattle access were 12.02 minutes/d/cow in November and 29.3 minutes/d/cow in June. Time spent in the stream varied greatly between individual farms, with one farm averaging only 0.7 minutes/d/cow and another farm averaging 23.31 minutes/d/cow. For this reason, local farmer input is very valuable. DEQ and the contractor met with representatives of the Page County Farmers Association to decide on representative estimates to use for the Hawksbill Creek watershed. The estimates used in the TMDL model resulted from local farmer input gathered at this meeting.

Comment 8

Page 3-4. Manure is not going to be applied at the same rate per month throughout the year due to weather conditions and there is a limited window when manure is actually applied to cropland.

<u>Response</u>
Estimates of monthly manure application rates were derived from local farmer input at a meeting between DEQ, the contractor, and representatives of the Page County Farmers Association. Based on local information, the few farmers in the watershed that have confined operations do not have large storage facilities, and generally apply manure evenly throughout the year as it is generated.

<u>Comment 9</u>
Page 4-7 last sentence – reads that "septic systems" were modeled as direct sources. Shouldn't this be "straight pipes"? Septic systems are not a source in the allocation scenarios.

<u>Response</u>
The sentence was corrected to refer to straight pipes rather than septic systems as direct sources. Septic systems were included as a contributor to the "Built-up" or urban land loads. This was further described in Section 4.3.1.

<u>Comment 10</u>
A more appropriate title for Section 4.3.1 is "Falling Septic Systems/Straight Pipes" and it should be described how failing septic systems were modeled.

<u>Response</u>
The title for Section 4.3.1 was corrected as suggested. Additional explanation of the inclusion of septic systems was provided in Section 4.3.1.

<u>Comment 11</u>
Section 4.3.4 – "(number of sewered and unsewered houses)" has no relevance to pets.

<u>Response</u>
This parenthetical phrase was removed.

<u>Comment 12</u>
What bacteria concentrations were used in the model for the interflow and ground water?

<u>Response</u>
While the hydrology of interflow and groundwater were modeled, bacterial loads from these sources were not explicitly modeled. Bacterial loads from these pathways were estimated as being minimal compared to the pathways of direct deposit and washoff.

<u>Comment 13</u>
Were existing BMPs modeled to define the "existing" source loadings? If not, why?

<u>Response</u>
The large majority of BMPs instituted in the Hawksbill Creek watershed are waste storage or waste management systems. These BMPs were incorporated into the TMDL model through estimation of input parameters and as a result of local farmer input. For example, in-house composting of poultry waste is common in the watershed. In consultation with local farmers, this practice was incorporated into the model by reducing the amount of poultry waste generated and applied in the watershed by one third.

Comment 14
    Was a sensitivity analysis conducted? Results?

Response
Qualitative sensitivity analyses were conducted during the allocation phase. As discussed in Section 5, the model was most sensitive to changes in direct deposition loads (especially from cattle direct deposition).

Comment 15
    Section 5.1 – second paragraph. "Straight pipes should replace "septic discharges".

Response
The suggested change was made in the report.

Comment 16
    Page 6-2, first paragraph. This paragraph is a generic statement. Is it really applicable to the Hawksbill Creek watershed? If not it should be removed.

Response
This statement is applicable to the urban area in the Town of Luray.

Comment 17
    Section 6.4 – update text to indicate that the Shenandoah and Potomac River Basins Tributary Strategy is in draft.

Response
The suggested change was made in the report.

Comment 18
    The magnitude of the reductions required to obtain water quality standards is astounding for a watershed that is 60% forested.

Response
The magnitude of reductions required in this TMDL is consistent with other TMDLs that have been developed since the new E. coli water quality standard was adopted in 2003. TMDLs developed under the new E. coli water quality standard do generally require much higher reductions than TMDLs developed under the previous water quality standard for bacteria. This is primarily due to the fact that the new standard is lower and does not allow any exceedance frequency.

Comment 19
    How does this TMDL meet the regulatory conditions pursuant to 40 CFR Section 130 that there is reasonable assurance that the TMDL can be met? The TMDL requires a 92 % reduction in the existing bacteria loading to Hawksbill Creek. Even the Stage I scenario to be implemented in an iterative process is not reasonable based on the nonpoint load reductions that are required.

Response
To achieve the large reductions required in this TMDL and other TMDLs across the state, a staged or phased implementation approach will be used. This approach will encourage incremental steps towards meeting the reduction goal and will monitor the success of those

steps through water quality monitoring. A phase I scenario presented in the TMDL report requires only a 60% reduction in pasture and cropland loads and a 80% reduction from built-up loads and direct livestock deposit. These interim goals as well as the final goal of 92% reductions can be met with common implementation practices. Research has shown that practices such as stream fencing and riparian buffers have reduced bacterial levels by up to 96% (see Page Brook Study; Charles Hagedorn).